STUDENTS' PERCEPTIONS OF DESIGN-BASED INTERACTIVE LEARNING TOOLS IN A CONSTRUCTIVIST-BASED LEARNING ENVIRONMENT

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Abstract

In this 21st century, the development of technology has brought changes in many aspects of our life, especially brought huge impact in education sector. Research has shown that constructivist-based learning environment provide students with more active, engaging and problem-solving learning experiences. Interactive learning tools such as blog and Kahoot are able to provide more interactive, real time feedback, enhance communication and collaboration between teacher and students. This study investigates students' perception of using interactive learning tools in a constructivist-based learning environment. Qualitative research approach was adopted to gauge the students' attitudes and perceptions towards the use of blog and Kahoot in their learning

process. The results of the study have shown that students have become active learners by actively participated in class activities. Apart from that, it has been found that students improve continuously, became independent learners, actively giving and receiving feedback from lecturer and classmates. The results of this study will bring benefits to lecturers and higher education institutions where they will understand the advantages of integrating interactive learning tools in the constructivist-based learning environment. Lecturers will need to design and impart skills and competences that employers need the most so that they can integrated in the curriculum.

Keywords

Interactive Learning, Constructivist-Based Learning Environment, Active Learning, Kahoot Quiz, Blog, Student Engagement

1. Introduction

Education is moving beyond traditional chalk and talk and even PowerPoint presentations, as these teaching methods have been shown to do little to improve students' engagement, thinking and communication skills (Beauchamp & Kennewell, 2010; Mazzolini et. al, 2012; Mazzolini & Daniel, 2014). Research has shown that the current graduates did not equipped with the skills needed by the employers. Curriculum today should be reviewed and redesigned to integrate future skills explicitly. Lunenburg (2011) noted that web technologies have emerged as potential enablers for more student-centered learning and, as such Malaysian education is poised to move towards these innovative teaching and learning methods (Sivapalan & Wan Fatimah, 2010). Many research results have explained that digital learning environment increased the teaching quality and affected on the students learning outcomes (Weng et. al, 2018).

Research has also shown that Constructivist-based classrooms provide students with active learning experiences as they learn to construct new knowledge, collaborate and engage more in their content (Petko, 2012; Beetham & Sharpe, 2013). Learning in a student-centred setting also develops student motivation which will lead to a more appealing learning environment (Paterson et. al, 2012). It has shown to be effective way in teaching and learning as it promotes critical reflection, allow students to be creative and problem solving. This research investigates students' perception of using interactive learning tools such as Kahoot quiz and blog in the constructivist-based learning environment.

1.1. Research Issues

Research indicated that current graduates lack crucial skills needed by the industry such as creative and critical thinking skills, communication skills and problem- solving skills (Tan et. al, 2009; Ramakrishnan & Yasin, 2012). As Sharma et. al, (2017) indicated that in The Malaysia Education Blueprint 2013-2025 has demands all the higher institution in Malaysia to maximize the use of ICT in the teaching and learning process to improve the quality of teaching and learning. Therefore, further research is needed to gauge students' perceptions on using these tools effectively in their learning process (Akbiyik, 2010; Kumar et. al, 2014). As such this research addressed this issue by investigating students' perception of interactive lecture tools such as the use of Blog and Kahoot Quiz, embedded in a Constructivist-based learning environment. Results of this study provided the lecturers with deeper insights for using interactive tools to improve student engagement.

1.2. Research Objectives

The principal objectives of the study were as follows.

- To develop a Constructivist-based learning environment centered around a design project.
- To incorporate Blog and Kahoot Quiz into the learning activities to foster constructivist-based skills.
- To investigate students' perceptions of using Blog and Kahoot Quiz as interactive lecture tools to engage their learning.

    Thus, this led to the research question being formed as to look at what are the students' perceptions of using interactive lectures in a constructivist –based learning environment?

2. Literature Review

The shift from conventional classroom education to constructivist-based learning environment did challenge the teachers and students in the current education environment. Universities and educators are finding ways to address the issues of traditional teaching and learning methods. In this 21st century, an advancement in technologies have challenged educators to develop students who can adapt to this demanding environment (Harper & Hedberg, 1997). Education in the 21st century has emphasized more on gaining the necessary skills such as critical thinking, creative thinking, collaboration, and communication skills (4Cs) (Bedir, 2019) to equip

students with the varied kind of skills to prepare them for working place. Educators need to be aware that the skills and knowledge they have taught in the class are transferable to the working place. Kimber & Wyatt-Smith (2010) have stated that learning today requires that some type of digital engagement of students in order to develop their higher order critical-thinking skills and therefore, educators today are challenged to innovate their teaching and learning methods with technologies (Laurillard, 2002) in order to meet these expectations of today's students. They are now tasked with the challenge to design learning environments and curricula which motivates and encourages students to be independent thinkers and multi-skilled workers, and create life-long learners (Laurillard, 2002; Kimber & Wyatt-Smith, 2010).

2.1. The Need for Curriculum Innovation

Harper & Hedberg (1997) and Kimber & Wyatt-Smith (2010) noted that our education systems today are not equipping student with these skills which are needed in today's society. Today's demands are placed on education system to produce graduates who can adapt to this fast-changing environment. Students need 21st century skills in order to improve their achievement and promote construction of knowledge that prepares them to be successful in their future careers (Alismail & McGuire, 2015). Harper & Hedberg (1997) and Tan et. al. (2009) have also stated that employers today are looking for graduates who can be problem-solvers, can adapt to any situations, creative, have good communication, teamwork and presentations skills and are technologically competent.

The classroom for the 21st century will be wherever the learner is located. Learning has to take place in anywhere and anytime. The conventional teaching and learning method are time limited, students only learn in the classroom hours. With the power of educational technology, things can be done in other ways. There is a need to focus on the effective use of technology in support of teacher pedagogical and curricular issues (Thornburg, 1999). The use of Web 2.0 tools has indeed benefited learners and teachers in various ways. It has greatly influenced their learning experiences in a social, cognitive, constructive manner (Mayes & de Freitas, 2007).

2.2. Using Interactive Learning Tools in Constructivist-based Learning Environment

Wilson (1996) defined a constructivist learning environment as *"a place where learners may work together and support each other as they use a variety of tools and information resources in their guided pursuit of learning goals and problem-solving activities"* (Wilson, 1996 p.5). Teachers acted as a facilitator in such environment and guide students to achieve their learning

goals (Wilson, 1996). Interactive tools such as blogs are web pages created by individuals or groups to post pictures, comments, share videos and audio for class activities or individual blog creation projects (Talandis, 2008). Yang (2009) stated that blogs are useful for students as a platform to reflect their learning process as well as use for communicating with each other. It is also a helpful tool for teachers to establish encouraging and nurturing discussion spaces that would enhance student reflections.

Blogs are useful in helping students enhance their writing and reading skills. There are many types of blogs, such as personal blogs, collaborative blogs, and blogs about news, fashion or political. Personal blogs are similar to online journals that consist of personal information (Korica et. al, 2006), whereas in a collaborative blog, the project leader and group members view and leave comments and group members are in charge of updating their own blogs. Results from the study conducted by Lee (2017) in investigated the students' perceptions towards the effectiveness in using blogging in learning process concluded that blogging promotes students' attention, empowers students to be more creative and encourage to integrate it into teaching and learning process to promote critical reflection and collaboration in the learning environment.

However, in the existing literature, there have been limited focus on blogging activity and how these activities influence the effectiveness of learning that occur in higher education classroom. Related constructivism has largely focused on face to face teaching and learning contexts (Garcia et. al, 2019). Therefore, this research looks into student's perception of Interactive lecture tools such as the use of Blog and Kahoot Quiz in the learning process. Kahoot is a visual graphics that created opportunities for the educators to revise, review and readdress the teaching contents of the class. Lin et. al. (2018) further defined Kahoot as a digital game-based system that provide opportunities for educators and students to interact through games in classroom settings. It usually being used in a midterm, final review or each class can begin with Kahoot to promote initial engagement. Kahoot allow students to revise what they have learned from previous lessons and become active learners. Interactive tool like Kahoot provides real time feedback, understanding and create opportunity for student participation (Baszuk & Heath, 2020).

3. Research Design and Methodology

Jonassen's (1999) Constructivist Learning Environment (CLE) model were being adopted to design the learning environment and mapped to the use of the design-based interactive lecture

tools to investigate student engagement, critical and creative thinking skills. This was adapted from other studies towards the perceived value towards usage of multimedia tools and blogs (Crozat et. al, 1999; Shih, 2004). Furthermore, it also helps the students to convey their own point of view in details in order to strengthen their feelings towards this learning environment.

3.1. Implementation of Study

Students who involved in this interactive classroom learnt how to build a 3-Dimensional (3D) modelling were among the research participant in the study (n=18). A set of design-based assignment were given to the students to engage in an active and collaborative learning environment. The interactive tools such as Blog and Kahoot Quiz were used as the platform for students to participate and engaged in their learning. The duration of the study took approximately 14 weeks and students were required to submit their 3D modelling assignment project at the end of the semester.

3.2. Data Collection Method – Phenomenography Study (Open-ended Questionnaire)

A qualitative research approach was adopted in this study to gauge the students' attitudes and perceptions towards the learning environment with the use of Blog and Kahoot Quiz as platforms for learning interaction. Phenomenography data analysis were demonstrated whereby the student comments were solicited to provide richer support on the overall results (Bowden, 2000). An open-ended questionnaire was adopted to further gauge the students' in-depth perceptions towards the learning environment. According to Bailey (1994), open-ended questionnaires are useful when there are any questions with long responses. Open-ended questionnaires allow respondents to answer as much as they like when simple answers do not suffice. When there are answers that could not be explained further in quantitative approach, word-based qualitative approach tends to become more relevant in order to investigate complex issues (Cohen et. al, 2007). The questionnaires were set to retrieve information on how a student gauges their perspective by learning using blogs. The collected data were being analyzed to investigate the following constructs: 1. Student engagement 2. Motivation to use the Interactive learning tools for design and collaboration 3. Interactive participation.

4. Research Findings

Students found to be actively participated in the blogging activities by writing their work progress of their assignments. They are consistently showing their work improvement from the

very beginning until its work completion. Students were also given opportunity to write their opinions and suggestions in the blog for further work improvements. Lecturer's and classmate's feedback became the source of valuable information to further improve their work. Blogs can generate a closer relationship between the students and students, teacher and students through the collaborative work discussions. Students have the opportunity to share, to discuss as well to solve the problems and to interact with team members and others while doing their project by using Blogs. The image below illustrated one of the student's blog with the assignment progress report done using blog:

The final details in the scene.

Here are some added details that I included as a part of my layout.
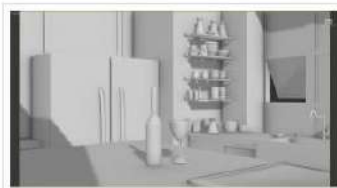
The final rendered scene. All of this image is not in high quality as it is in .JPEG format. The final render is rendered in .PNG at the size of 1920X1080.

Figure 1: *Students Blog Output on Their Worked Assignments*

(Source: Hamdan, 2014)

To further strengthen the study, these are some of the students' feedbacks on the use of blog:

Table 1: *Students' Feedback on The Use of Blog*

Student	Student's Comments
Student #1:	*"The blog helped me document all my working progress and yet I can refer to others blog post for further improvements!"*
Student #2:	*"I like to use blog to recap what I had learnt from the very beginning until the work completion, I learnt a lot by practicing my writing and critical thinking skills during the assignment progress."*
Student #3:	*"I never expect that this blogging activity can archive all my working progress stages and I can see how far I've been progressively improving on my assignment quality!"*

(Source: Kwok, 2014)

Besides blogging, students were also very excited to get themselves involved in the weekly quick lecture quizzes revision. The interactive tool used was the Kahoot Quiz. Students were given a short quiz each week to recap what they had learned and understand from the lecture. Students were very much engaged and enjoyed each time they participated into the quiz. After each week's quiz session has ended, the students already felt excited and couldn't wait for the next quiz session. This inculcates that the interactive tool had greatly engaged into the students' learning process.

Figure 2: *Students Use of Kahoot Quiz*

(Source: Kahoot.it, 2021)

To further strengthen the study, these are some of the students' feedbacks on the use of Kahoot Quiz:

Table 2: *Students' Feedback on The Use of Kahoot Quiz*

Student	Student's Comments
Student #1:	*"Amazing for Kahoot, I learnt to think fast. My thinking capability changed to better!"*
Student #2:	*"Interesting because we answer them live on spot that shows in front of the screen where everybody go – woahhh!!"*
Student #3:	*"Awesome! More quizzes after this!"*

(Source: Kahoot.it, 2021)

5. Pedagogical Implications

The significance of the research was to implement an interactive learning activity with the use of Blog and Kahoot Quiz' for further interactive classroom solutions and to investigate the learning experience from both teacher and students with the interactive tool used within this learning environment.

5.1. The Importance of the use of Blog

The integration of blog in the learning process has brought huge advantages to the students' learning process. Writing their work progress in blog with the use of ICT tool helps generate an interaction among the teachers and students to produce more engaging environment in learning

(Wegerif & Dawes, 2004). Students have shown consistency in the learning process, provided opportunities for collaboration, express own opinions, suggestions, solve problems and generate closer relationships between teachers and students.

5.2. The Importance of the use of Kahoot

The use of Kahoot has showed that students were more engaged in the learning process. Apart from that, students were able to recap and remember better about what they have learned from the lessons. It has helped students to understand the lessons better. The learning process has become more interesting.

In this study, the use of Blog and Kahoot Quiz were able to engage the students' participation by having gradual discussion in a constructive manner. The interactive technology tools hence become an active solution to provide the learners a more conducive learning outcome to further enhance in their learning (Spector, 2013). Students showed that they have positive attitudes towards learning in the constructivist-based learning environment. Students' collaboration skills, communication skills, problem solving skills, and creative thinking skills were enhanced by using interactive learning tools. Students became problem solvers, decision makers and active learners in this learning environment.

6. Conclusion

There was a saying that, "A picture speaks a thousand words". With the use of visual elements, it did help the learners to engage much deeper understanding towards learning. Interaction that performed through visualization help engage the students to learn better in their learning process (Beeland, 2002). The teacher and learners are able to express their thoughts and understanding by generating an interactive activity to trigger the learning success. With the used of Kahoot Quiz, interaction also help to enhance the communication between the teacher and students through the forms of discussion, problem solving and critical thinking (Beauchamp & Kennewell, 2010).

6.1. Research Limitations

This study was limited to be tested out at a wide range of education level. For instance, this study only could cover a certain design courses and not to any other tertiary education institutions in Malaysia. It would be good if this research can be carried out at all education levels, whether or not for private or non-private institutions. Another limitation found in this study was that the

duration of the class given was only last for one semester (14 weeks) which was limited within the classroom setting, and there will be no continuation of subjects to be taught in the next semester. Therefore, it was limited for this study to further continue with other explorations.

6.2. Scope of Future Research

As for future research, study can be done in a wider range of target group. For example, more future explorations targeted to the students from other faculties as well. Of course, it will be pleased if the research can be tested and carried out at other university level. It could be better if various students' learning attitude can be examined to find out more potential research findings in near future.

6.3. Concluding Remark

According to Weaver (2005), students who actively involve themselves in the classroom have a positive impact towards the learning process. Instead of just letting the learners passively observe the learning process, active learning acts as "activity-based" instruction where learners have the chance to participate with hands-on experience (Anderson et. al, 2007). With that series of action taken, they greatly believe that in order for students to achieve a certain job task they must actively participate in the activity using the four major concerns adapted in the active learning model (Bandiera & Bruno, 2006).

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